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Mr. David Fanning & Co.
FRONTLINE
125 Western Avenue
Boston, Massachusetts

Dear David (Mike, Bill & Marrie):

We have traveled the highways, and by-ways, and faultlines of California, following the "big crack" and some smaller ones, and we offer this report for your consideration.

A dramatic litany can be recited for the "earthquake scenario" in California:

---a Cal Tech geologist says that within the next 50 years there's a 50-90% probability of a devastating earthquake along the 200 miles of the San Andreas fault stretching from the Salten Sea north past Los Angeles. One problem is that it could happen fifty years from now -- or tomorrow;

---the Federal Emergency Management Agency (FEMA) says that within 30 years, California has a better than 50-50 chance of an earthquake similar to the one that struck San Francisco in 1906 (the equivalent of 8.3 on the Richter scale) -- and that all levels of government (federal, state and local) are essentially unprepared to deal with the damage and casualties that are likely to result;

---FEMA says the next "big one" will be a disaster of unprecedented proportions in America in this century, and that the destruction is likely to be greater than any natural or man-made disaster in the U.S. since the civil war;

---there's general agreement that major earthquakes (7.0 and above on the Richter Scale) are inevitable in California and that most likely they will occur without warning (earthquake prediction is a relatively primitive and sometimes controversial science). Seismologists at Cal Tech record about 10,000 quakes a year in the state that can be felt (2.0 or above) and about 15,000 in all.

California is important: the estimate is that alone, it ranks ninth in the world economically. Nationally, it's a vital center for both the defense and high-tech industries and is a banking/financial center (no need to discuss here the entertainment/television industry since that's already a disaster area).

FEMA has written "worst-case" scenarios for 7.5-8.3 magnitude earthquakes for the major fault systems in both northern and southern California. Depending on where (epicenter), when (time of day), and magnitude, the death estimates range from three to 23-thousand; the injury estimates about four times that; and the property damage from $15-70-billion. It's estimated that essential services would be problematical for at least 72-hours after the quake. Certain life-line industries that affect the nation -- military, high-tech, financial -- would be dramatically weakened.

For example: the California Bankers Association estimates that if the Bank of America's computers were "down" for three days, the California economy would be severely affected; in five days, the nation's economy would be seriously affected; in one week, repercussions would be felt throughout the world.

For example: the aerospace industry (it's estimated that 25% of all defense contracts are in California) is centered within a 10-mile radius of the Newport-Inglewood fault in Los Angeles -- and in what the current Newsweek (issue of July 15, 1985) calls "Aerospace Valley" in southern California near Palmdale, which is crossed by the San Andreas fault. An "earthquake engineer" told us, off-the-record, that the aerospace industry is not prepared for "the big one".

I. <u>THE JOURNEY</u>.

1. <u>The San Francisco Bay Area</u>.

The Hayward fault is less well-known but potentially more dangerous (and destructive) than the San Andreas. It's one of the most active faults in America, bisecting densely-populated Oakland-Berkeley, running beneath the Cal football stadium and the Alameda County Emergency Operations Center (!), south to Livermore (and the lab). Rick Eisner of the Bay Area Earthquake Preparedness Program says: "In the next 30 years, there's a one-in-five chance of a catastrophic earthquake on the Hayward fault".

The San Andreas fault moves inland at Daly City

where it endangers densely-populated South San Francisco and heads south along beautiful Interstate 280 -- through the Stanford Linear Accelerator (SLAC), Silicon Valley, and past San Jose (now, I think, the tenth most populous city in America). SLAC does about $80-million in government business. That "earthquake engineer" also told us that 90% of the buildings in Silicon Valley are highly vulnerable to earthquakes because of "tilt-up" construction. The danger is compounded by the threat of toxic waste spills that could result from earthquakes (the California Seismic Safety Code says nothing about exotic chemicals that are stored and used in Silicon Valley).

2. San Juan Bautista. The San Andreas cuts through this historic old California setting, virtually beneath the mission and outside the Faultline Cafe -- where, if there's a quake while you're eating, there's no charge for the meal.

3. Hollister. This is the town associated with the Marlon Brando movie, "The Wild Ones". It's also called (by Gary Orr, director of emergency services for Santa Clara County) "the earthquake capital of the world" -- not because of major quakes or the threat of one but because of constant smaller ones, of constant creeping that cracks sidewalks displaces curbs and warps buildings. In the Hollister Hills, the U.S. Geological Survey (USGS) maintains instruments measuring creep inside the Almaden winery.

4. Coalinga. This is where the most recent quake of significance occurred in California -- a 6.7 in 1983, which destroyed some 500 buildings -- caused by a fault they didn't know was there, that wasn't mapped (they don't know where all the faults are). It's possible that this could have been an isolated incident -- or a foreshock of things to come along the San Andreas. Yet, since the quake, Coalinga's population has increased (from 7200 to 7600). As Peggy Donaldson, a local realtor and head of the Chamber of Commerce, says: "(the quake) hurt some people (24 businesses and millions of dollars lost but no lives) but it helped the town".

5. Parkfield. Halfway between S.F. and L.A., in a valley with a population under 200, this is now the most studied and carefully watched point along the San Andreas. The USGS has predicted a 5-plus quake here for 1988 (give or take 2-4 years which, with some exceptions, is about how precise earthquake prediction gets). With the help of a one-room schoolhouse teacher, laser measurements are being regularly taken here. It's speculated that the Parkfield fault could trigger major quakes -- north or south along the San Andreas, in the more heavily populated areas of the state.

6. Carrizo Plain. This is probably no more than an aerial shot but the most striking physical evidence of the San Andreas fault -- literally, a long gash in the landscape through the middle of California, from the cattle ranches of Bitterwater Valley to the oil fields of Taft and Maricopa.

7. Palmdale. On the San Andreas fault, just northeast of Los Angeles in the heart of "Aerospace Valley" (Edwards AFB is nearby). There's a monument overlooking the town -- to the S.A. fault, which crosses Highway 14, about a mile from the Rotary and Kiwanis signs et. al. symbolizing growth and the future.

8. Los Angeles. As everyone knows, L.A. has many, many faults -- and the Newport-Inglewood is potentially the most destructive to life and country. It cuts through an area densely populated with people and defense industries. There are 8-thousand buildings in L.A. on the earthquake hazard list (and the best they hope for is to bring them up to 2/3 of current earthquake safety standards). Water and power supplies are vulnerable (faults cross two of the three aqueducts that supply L.A. with water). We all know about Los Angeles. What we don't know much about but should is ...

9. San Bernardino. Local officials claim this is the biggest county in the world, covering 1/8 of California with a population now more than one-million. During the next ten years, it's expected to be one of the fastest-growing areas in America; it may also be the one most vulnerable to a major earthquake. More than 30 active fault lines cross the county's 20-thousand square miles and most of the population lives close to the three major faults: the San Andreas, the San Jacinto and the Cucamonga. Water and gas lines cross the fault here; a major freeway cloverleaf straddles another fault. A community college is on the faultline, as are commercial and residential areas. And, the Emergency Operations Center -- the nerve center during any major disaster -- is unuseable because it was built in the basement of the public library, in an area with a high water table, and is periodically under water, and there's no money for a new one somewhere else. As the deputy sheriff in charge of emergency services says: "it's like sitting on a hydrogen bomb".

II. SOME POSSIBLE CHARACTERS.

1. Kerry Sieh: a notable young Cal Tech geologist whose trenching work in southern California has pioneered great advances in the science of dating past quakes and projecting when new ones might occur. Says Sieh: "San Bernardino is the city that waits to die."

2. Terry Jagerson: San Bernardino Deputy Sheriff, director of emergency services and helicopter pilot. He shows you where the faults are, where county water, electricity and natural gas supplies will be cut off when the big quake hits, and he sounds worried.

3. Phil Day, director of San Francisco Emergency Services: he admits that an earthquake the size of the 1906 quake "will overwhelm us." Still, each April, he puts on an elaborate Earthquake Preparedness Week complete with National Guardsmen and fake blood (this event is state-wide).

4. Rich Eisner, director of the Bay Area Regional Earthquake Preparedness Program (BAYREPP). He paints a grim picture of what will happen in the Bay area if and when the "big one" strikes again.

5. Dr. Mike Callaham, director of the emergency room at the University of California Med Center in San Francisco. He points out that in the event of the big quake, not only will the emergency room lack the blood, medicine, beds and personnel to deal with the inevitable flood of victims but that the hospital itself is likely to be only moderately functional. Most of the injured, he says, will be on their own.

6. Peggy Donaldson, the realtor and president of the Coalinga Chamber of Commerce. In effect, a 6.7 earthquake put Coalinga on the map and things have never been better -- a view that may well have something to do with her business and her stake in Coalinga's future.

7. Duane Hamann, the one-room schoolhouse teacher in Parkfield who now also works for the USGS -- taking laser measurements of ground movements in the area where a significant quake is expected any time now.

8. Henry Twisselman, a rancher in Bitterwater Valley at the northern end of the Carrizo Plain. He still gets around with a cane and a pick-up despite two hip-replacement operations. He admits to feeling some serious shaking now and again and allows the USGS to keep monitoring instruments on his property but says Henry: "I've lived along the fault for 70 years and nothing's happened yet."

9. Alice Reyes, who lives in and operates a gas station squarely on the San Andreas in Maricopa at the southern end of the Carrizo Plain. She's described as a "tough old ex-prostitute" by a geologist who's worked in the area, and what she says about geologists probably isn't useable on the air. Does she believe their warnings about the big quake to come? "They don't know whether to crap or go blind", says Alice and she's not moving out for anybody. She is a character.

10. Jim Berkland, the Santa Clara County geologist who -- on the day we met him -- was wearing a bright red sport coat and the biggest shamrock tie pin I've ever seen, and whose claims for predicting earthquakes (and his methods) are a subject of some controversy. He studies the moon, the tides and the habits of house pets (when local lost-and-found columns show a sharp increase in the number of missing cats ("lost gatos"), says Berkland, you know an earthquake's coming. (It's not as far-out as it may sound.)

Berkland is also notable for his claim that the death and casualty figures for ~~the~~ 1906 were covered-up (principally by William Randolph Hearst who feared a drop in real estate values, according to Berkland). He apparently has the support of a local historian and this could be an interesting sidebar story in the film.

11. Marsha Adams is a biologist/statistician who runs a 24-hour hotline for "earthquake responsive" people who report on their health changes as precursors of a quake. (She got several calls before the Coalinga quake in 1983.) She works up in the Woodside hills overlooking Palo Alto and the bay, feeding her data into a bank of computers (and feeding her peacocks) for which she claims a 95% accuracy in predicting earthquakes (she also has a satellite dish and a spiel about how humans are affected by quakes). She is a consultant to SRI (formerly the Stanford Research Institute, now just SRI).

12. Clarissa Bernhardt, is a psychic in Los Angeles, who is said to be remarkably accurate at forecasting earthquakes (though some of her other predictions, which sometimes appear in the National Enquirer, have been known to miss the mark). This is California, remember.

13. Dr. Bruce Boalt, head of the UC-Berkeley seismic station and chairman of the State Seismic Safety Commission. He apparently takes the position that earthquake prediction is -- to put it simply -- impossible.

This represents neither a complete list of the people we've seen, by any means, nor is it a complete cast of characters. It doesn't account for a cross-section of ordinary citizens living on the faultlines. It also seems clear we'd need someone in the military/defense area and in the banking/financial field (we've been to Bank of America which interestingly enough isn't too anxious to talk about such things, saying it falls in their "security" area but I have to believe that at some point they'd talk to us). We're also looking up a 94-year-old eyewitness to the 1906 quake who's said to have some stories to tell. And, we're still in search of a social scientist (surprisingly little seems to have been done in the field of earthquakes and human behavior). The best prospect so far is Dennis Miletti (sociology) at Colorado State in Fort Collins, and we're on his trail.

If Miletti's the one and we can't catch him in California, that makes Colorado another possible location. We would have to add to that list of possible locations: Sacramento, since that's where the state offices are (for emergency services, seismic safety, political etc.) and Washington D.C. (if that's where we'd have to go for the military/pentagon view).

There also are some additional filming possibilities, depending on when we shoot. They include:

--- the "shakey van" (a Japanese invention, naturally), which is used during Earthquake Preparedness Week and (it is hoped) taken to schools and shopping centers where the complacent masses can get the feel of a quake;

--- the "shakey table", a 20 X 20 concrete table at UC-Berkeley where quakes of various magnitude can be simulated to test structural designs and materials;

--- the Earthquake Show that is part of the tourist attraction at Universal Studios in Los Angeles;

--- the San Luis Obispo Training Institute (just up the road from the Diablo Canyon nuclear power plant), where local officials from around California are trained to deal with disaster situations -- like major earthquakes;

--- Earthquake Preparedness Week, which takes place each April.

III. THE STORY.

Earthquakes have inspired fear and anger from the earliest days of human history: fear of the unknown, anger at the uncontrollable and the unpredictable. They also produce apathy, fatalism and defiance -- and a few dedicated souls who try to understand them and even try to minimize their impact on our lives. Earthquakes are part of our folklore and mythology, and of our history.

Certainly, there are issues: of safety and preparedness, or the lack of it -- the danger to lives and property; of economics, which could affect the nation if not the world; of defense and security. But what emerges so far from these travels and ruminations is more a mosaic than a straight story line -- a mosaic of people and places and behavior, of a variety that perhaps could only be found in California but whose condition and state of mind may be universal.

There are, so far, no central characters that carry this journey from beginning to middle to end but there are themes that come to mind, and that could provide coherence and meaning for the trip.

1. Beauty and the beast, and the tension that contradiction creates (for the film if not for the people in it). The faults/earthquakes are creators (of mountains, valleys, lakes - of much of the extraordinary landscape of California) as well as destroyers. What lurks in the background -- beneath the ground -- of the good life is the inevitable catastrophe that we can't prevent (and that, by and large, we don't much want to think about).

2. Man versus nature, and human nature -- the relatively few scientists and public officials (with relatively little money) who are working against time and general indifference, dealing with phenomena so deep within the earth that they can't be observed or tested in a laboratory (in general, it takes an earthquake to study earthquakes).

3. The faults/earthquakes remind us of what we don't know ~~and~~ or understand -- of what we're still trying to learn (and cope with) about the world in which we live; even in this age of high-tech and space exploration, we don't know all that much about what's going on below us (and has been for thousands of years), or how it might hurt us.

9. Earthquake/Drasnin

Finally, I suggest we also consider the timing for shooting this film -- mostly because I think it's important for schools to be open when we do it. While the great quake of [redacted] may not happen in our lifetimes, it seems more than likely to happen during the lifetimes of today's school-children. What they know and think, how they feel and react is, I think, of importance to the subject (for dramatic purposes, if nothing else). In addition, SLAC (for example) is shut down during the summer and isn't operating again until October. The same probably holds true for the "shakey table", the "shakey van" and the San Luis Obispo Training Institute. (And, according to Berkland, the best period for earthquakes in California is from November to April.) None of this precludes our doing it now. But if we could agree on another film to do right now -- England, say -- then I'd recommend doing earthquake after that. If not, let's go look at our faults.

Warm (and smokey) regards to all. I look forward to a consensus soon. All my best.

Sincerely,

Irv Drasnin

PS: "Smokey" refers to the conditions in California right now, not in my lungs -- which today grudgingly acknowledged (celebrated is not yet the right word) the fourth month of smokelessness.